Journal of the Society of Arts.

FRIDAY, AUGUST 10, 1855.

SOCIETY'S VISIT TO PARIS.

The Secretary to the Society is now in Paris, engaged in making arrangements for the visit of the Members and their friends. The Imperial Commission cordially reciprocate the kindly feeling which has induced the Society of Arts to visit the Exposition under their charge, and will do all in their power to render the visit agreeable and profitable.

Since the circular dated the 1st instant was issued to the Members, the London and South-Western Railway Company have intimated that in the course of a few days Return Tickets will be issued from London to Paris, *via* Southampton and Havre,—available for 15 days,—for 48s. first class, or 32s. second class. It should be remarked that the Paris Service on this line is limited to four days in the week, viz. :—Mondays, Wednesdays, Fridays, and Saturdays.

FAILURE OF THE INDIAN SILK-WORM IN MALTA.

The following copy of a despatch, from his Excellency the Governor of Malta, has been received from the Minister of War :—

Palace, Valetta, 7th July, 1855.

MY LORD, —I very much regret to have to report to your Lordship, for the information of the Society of Arts, the complete failure of the Indian silk-worm, the *Bombyx Cynthia*, this year in Malta.

2. Throughout the year 1854 their numbers increased so rapidly that no doubt was entertained of the success of acclimatising this silk-worm in the South of Europe. In December, 1854, I had them living both in the house and in the open air, in wind and rain. But about that time many began to die. In January, 1855, they generally died soon after they were hatched, notwithstanding that the utmost care was taken of them.

3. On examining the eggs with a powerful lens, I could see myriads of worms formed in them with the shell just broken, but the animal apparently had not the power in most cases to extricate itself. When it could do so, I conclude it must have been too weak to live.

4. A room in the house was kept dry at night, at a temperature of about 65° of Farenheit, a temperature which during the same month of 1854 appeared to suit them perfectly well. Every reasonable experiment suggested was tried, yet only seven worms were saved. These produced eggs, but they never hatched.

5. From this I infer that the climate of Malta will not suit them. In Italy they promised to thrive, and succeeded the first year; but I understand that this year they have failed also in Italy. I have not recently heard whether others sent to Algeria are or are not prospering.

6 It may be useful to state how the *Bombyx Cynthia* was successfully transported from Malta to the West Indies after many attempts to bring it from India to Europe had failed.

7. Having first obtained the authority of the Directors of the Peninsular and Oriental and of the West India Royal Mail Steam Packet Companies, about thirty fresh cocoons were placed in bird cages and suspended in the cabins of the surgeons of the steam ships. This was done that males and females might be kept together when the chrysalides became moths. In the moth state they required no food. On the voyage they laid their eggs, and these eggs began to hatch on their arrival at the Island of Grenada, in the West Indies,

8. They were multiplying fast when I last heard from Grenada, but that being now several months ago, I cannot say whether they continue to thrive there.

I have, &c.,

(Signed) WM. REID, Governor.

LIST OF BOOKS AND PAMPHLETS ON THE DECIMAL-COINAGE QUESTION.

In the preparation of this list assistance has been received from the following gentlemen :—Messrs. Edgar A. Bowring, W. Brown, M.P., Prof. De Morgan, J. A. Franklin, Dr. J. E. Gray, W. Miller, F. J. Minasi, R. R. R. Moore, General Sir Charles Pasley, T. W. Rathbone, H. Reid, E. Ryley, J. Yates, F.R.S., &c., &c.

*** Proposals for a Decimal Coinage, arranged upon the present pound Sterling, or on some unit having a decimal relation to it, are marked by the letter (A) after the title;

Plans founded upon the Penny, Halfpenny, or Farthing, are marked (B); and

Other plans (C).

FROM 1784 TO 1852, ARRANGED CHRONOLOGICALLY.

*Jefferson, Th.: Notes on the Establishment of a Money Unit of a Coinage for the United States, 1784, in *Randolph*, Mem. and Correspondence, 1829, p. 133. C.

Jefferson: Report on Money, Weights, and Measures; Philadelphia, 1790. C.

Report on Weights and Measures; folio, London, 1814.

* "Calculator": Observations on the Report of Weights and Measures; 8vo., London, 1814. B.

*Eliot's Letters on the Political and Financial situation of the Country; 8vo., London, 1814. C.

*"Mercator": Sketch for a New Division and Subdivision of Monies, Weights, and Coins; 8vo., London, 1814. A.

*Goodwyn, H.: Account of a Plan for a New Silver Coinage, for introducing the Decimal principle; 4to., London, 1816. B.

*Goodwyn, H.: A Plan for a New General System of Weights, as a Supplement to the Plan for the New Silver Coinage; 4to., London, 1816. B.

*"Libra:" Two Letters to the Editor of the *Times*, on Mr. Croker's plan of Decimal Coinage; London, 1816. B.

*Plan of Decimal Weights and Measures submitted to the Dutch States General by the King of Holland; London, 1816. C.

*Proposals for a New Money System; London, 1816. B.

*Remarks on the Proposal for a New Money System; London, 1816. B.

*The British Metre and its Derivatives, being a sketch of a Proposed Reformation of the British Measures, Weights, and Coins; 8vo., London, 1820. A.

Adams, J. Q.: Reports to Congress on Weights and Measures; Washington, U.S., 1821.

*Babbage, Charles: Economy of Manufactures; 8vo., London, 1832. A.

*Pasley, Lieut.-General Sir Charles, K.C.B.: Observations on the Expediency and Practicability of Simplifying and Improving the Measures, Weights, and Money used in this Country; London, 1834. (An Abstract of the foregoing was lithographed and distributed in 1831.) A.

Cory, J. P.: Proposal for the introduction of the Decimal Division of Money: Paper read before the Numismatic Society, May 24, 1838; *Numismatic Chronicle*, vol. i., 1839. B.

*Watt, J.: A System of Tables on British Money, Weights, and Measures; 1837. B.

*De Morgan: Decimal Coinage; Companion to the Almanack for 1841. A.

*Maslen, Decimus: A new Decimal System of Money, Weights, Measures, and Time; 8vo., London, 1841. A.

*Report of the Commissioners for Restoration of the Standards of Weights and Measures; 1841; (Redelivered 1855.) A.

Taylor, Henry: Observations on the Current Coinage of Great Britain; 1846. From *Banker's Magazine*. A.

*Taylor, H.: Simple Arithmetic as Connected with the National Coinage, Weights, and Measures; London, 1847. A.

Remarks on Decimal System of Keeping Accounts; by the late Mayor of Bewdley; Bewdley, 1847.

*Debate in the House of Commons, April 27, 1847. Hansard's Debates.

*De Morgan: Decimal Coinage; Companion to the Almanack for 1848. A.

*Taylor, H.: The Decimal System applied to the Coinage, Weights, and Measures, of Great Britain; 4th edition, London, 1851. A.

Anon: Decimal Coinage; *Chambers' Journal*, March 13, 1852. A.

*Liverpool Chamber of Commerce: Address to the President of the Board of Trade; 1852. A.

*Liverpool Chamber of Commerce: Report of Special Committee; 1852. A.

1853, ARRANGED ALPHABETICALLY.

*Alexander, James: Suggestions for a Simple System of Decimal Notation, and Currency after the Portuguese Model. Paper read before the Royal Scottish Society of Arts, December 12th, 1853; 8vo., London, Houlston and Stoneman. B.

*Cooper, J. Collingwood: Decimals and Decimal Coinage; 12mo., London, Simpkin and Marshall, 1853. A.

*Franklin, J. A.: The Decimal System Facilitated and Adapted Intermediately to Routine Methods of Account, Money, and the precious Metals, with Tables, &c.; 4to., London, Letts & Co., 1853. A.

Galbraith, Rev. J. A.: On a Decimal Currency. Paper read before the Dublin Statistical Society, May, 1853; Dublin, Hodges and Smith. A.

*Gray, Dr. J. E.: Observations to Report on Decimal Coinage; London, 1853. From *Times*. B.

*H. B.: Table for a Decimal System of Accounts; folio, London, Smith and Elder, 1853. A.

Hogg, James: Decimal Coinage, Weights, and Measures; Hogg's Instructor; Edinburgh, November, 1853.

*Jack, Professor: On Uniform Weights, Measures, and Moneys. Paper read before the Society of Arts, Feb. 23, 1853. *Journal of the Society of Arts*, Vol. I., page 157. A.

*Laurie, J.: Customs Tariff and Currency Reforms, with Decimal Currency Tables; Manchester Commercial Association Memorial, 4to., 1853. A.

*Mears: Decimal Coinage Tables; London, Adams, 1853. A.

*Milward, A.: A Letter to the Chancellor of the Exchequer, advocating the issue of a Five-farthing Piece; London, Bell, 1853. A.

*Rathbone, Theo. W.: An Examination of the Report and Evidence of the Committee of the House of Commons on Decimal Coinage, with Reference to a Simpler, Sounder, and more Comprehensive Mode of Proceeding; London, Ridgway, 1853. (2nd and 3rd Edition, with a preface and postscript, 1854.) B.

*Report of the Select Committee of the House of Commons on Decimal Coinage; folio, London, 1853. A.

*Rozzell: Practical Suggestions for Facilitating the Adoption of a Decimal Currency; 8vo., 1853. A.

Ryley, E.: Decimal Coinage. A brief comparison of the existing system of Coins and Money of Account, of that proposed by Decimal Coinage Committee, and of another system: 8vo., London, Metcalf, 1853. A.

*The New Decimal Money; from the *Phonetic Journal*, 1853.

1854, ARRANGED ALPHABETICALLY.

*Aintliche: Reduction des Zuger Currentgeldes, in das Neue Schwitzergeld; 1854.

*Alexander, James: Decimal Ready Reckoner, 1854; a card with slides.

*Aslits' Decimal Coinage, with a proposal for Decimalising our Weights and Measures; 12mo., London, 1854. A.

*Bewley: Decimal Interest Tables; 1854.

*Bishop, S. H.: Decimal Coinage and Accounts; London, 1854. A.

*Bowring Sir J.: The Decimal System in Numbers, Coins, and Accounts, especially with reference to the Decimalization of the Currency and Accountancy of the United Kingdom; London, Ingram and Cooke, 1854. A.

*Brown, W., M.P.: Letter to Francis Shand, Esq.; 2nd edition, London, Ridgway, 1854. A.

*Calder, Rev. Fred.: The proposed Decimal Coinage; 12mo., London, Whittaker and Co., 1854. A.

*Davidson, Alex. Brand: The New Decimal Coinage; Aberdeen, 1854. A.

*De Morgan: Decimal Coinage; Companion to the Almanack for 1854. A.

*Decimal Association: Proceedings, with an introduction by Professor De Morgan; 8vo., London, Rickerby, 1854. A.

*Eclectic Review: Review of the Report of the Select Committee of the House of Commons; November, 1854. A.

E.R.A.: Suggestions for a complete Decimal System, reprinted from the *Patriot*; 1854.

Ferrari: Calcolo Decidozzinale; Turin, 1854.

*Franklin, J. A.: Letter to Mr. W. Brown, M.P., on the Impracticability of the Franc or the Tenpenny unit. Read before the Statistical Section of the British Association at Liverpool; September, 1854. A.

Gibbon: Report on Utility of Uniform System in Measures, Weights, Fineness, and Decimal Accounts; Charlestown, U.S., 1854.

*Godwin, Edward: A Manual of Decimal Monetary Calculations; No. 1, London, 1854. A.

*Gray, Dr. J. E.: Decimal Coinage; What it ought, and what it not to be. By one of the Million; London, Ridgway, 1854. B.

*Gray, Dr. J. E.: Comparative Statement of the Value of the Pound and Penny Systems of Decimal Coinage; 1854. 2nd and 3rd edition, 1854. B.

Hoare: Mensuration made easy, or the Decimal System and its application to the daily employments of the Artizan and Mechanic; 1854.

*Laurie, James: Manual of Foreign Exchanges; 12mo., London, Hall, Virtue, and Co., 1854. B.

*Laurie, James: A Practical Analysis of the Comparative Merits of the One Pound and Tenpence as the Ruling Integer of a Decimal Currency for the United Kingdom. With Tables of Merchandise; 8vo., London, Hall, Virtue, and Co., 1854. B.

*Mears: The Decimal Calculator; London, Adams, 1854. A.

*Miller, W.: Decimalization of Coins and Accounts. Paper read before the Society of Arts, May 5th, 1854. *Journal of the Society of Arts*, Vol. II., page 414. A.

*Miller W.: Letter to Mr. W. Brown, M.P. Read before the Statistical Section of the British Association at Liverpool, September 25th, 1854. A.

*Minasi F. J.: A Word in Behalf of the Poor Man's Penny; London, Alliston, 1854. B.

*Minasi, F. J.: On a Decimal Coinage for the United Kingdom; Paper read before the Statistical Society of London, June 19th, 1854; Journal of the Statistical Society for September, 1854. B.
*Monro, A.: Letter to the Chancellor of the Exchequer; Glasgow, 1854. (2nd Edition, 1855.) A.
Pitman, Isaac: A Brief Account of the New Decimal Money, with Report of Dr. Bowring's Address on a Decimal Currency, at Manchester; London, Pitman, 1854. A.
*"Retired Merchant:" A Short and Easy Method of changing the present currency into the Decimal System; London, Ridgway, 1854. A.
*Rathbone, Theo. W.: Comparative Statement of the Different Plans of Decimal Accounts and Coinage which have been proposed by the Witnesses examined before the Committee of the House of Commons, and others; paper prepared for the Statistical Section of the British Association, September 25, 1854; with a Compendium of the Scheme of Pounds, Florins, Cents, and Mils, and the Scheme of Pounds, Tenpennies, and Pence, Comparatively Stated, with Abstract of the Discussions; "Observations of a Merchant," on the statements of the Chairman of the Committee, Mr. W. Brown, M.P., and Professor De Morgan, in the "Proceedings of the Decimal Association;" Correspondence with the Chancellor of the Exchequer; London, Ridgway. A.
*Richardson, Samuel: Decimal System in Coins, Accounts, Weights, and Measures; Liverpool, 1854. A.
Strachan, James: A Short Exposition of the Proposed Decimal Coinage System; Aberdeen, Gray, 1854. A.
*Smith, J. B., M.P.: Should Decimal Coinage be adopted without a Decimal System of Weights and Measures? Manchester, 1854.
Smith, B.. Arithmetic for use of Schools; 8vo., London.
Tallant and Allen: Decimal Money Tables; 1854.
*Tate, T.: The new Coinage considered in relation to our School Arithmetics; reprinted from the Educational Exhibition, 8vo., London, Longman and Co., 1854. A.
Tegetmeier: Arithmetical Tables, including those of the Decimal Coinage; 1854.
*Thomson, W. T.: Decimal Numeration and Decimal Coinage. Paper read before the Institute of Actuaries, January 30, 1854; Edinburgh, Blackwood. A.
*Yates, J.: On the French System of Measures, Weights, and Coins, and its Adaptation to General Use. Paper read before the Institution of CivilEngineers, Feb. 28, 1854; London, Ridgway. C.
*Yates, J.: On a Method of Substituting Francs and Centimes for the Present English Metallic Currency. Paper read before the Statistical Section of the British Association at Liverpool, Sept. 25, 1854. *Assurance Magazine* for Jan., 1855. C.

1855, ARRANGED ALPHABETICALLY.

*Anon: First Steps towards a Universal System of Decimal Coinage; London, 1855. C.
*Anon: Remarks upon a Decimal System of Accounts and the Coinage; 8vo., Glasgow, 1855.
*Anon: Reasons against the Pound being adopted as the Integer of a System of Decimal Coinage; reprinted from the *Times* City Article, May 3, 1855. B.
*Annuaire pour l'An 1855; presenté du Roi par le Bureau de Longitudes; 12mo.; Paris.
*Arbuthnot: Observations on Mr. T. W. Rathbone's Pamphlet on Decimal Coinage; reprinted from the "Decimal System," 1855. A.
Banfield, T. C.: A Letter to Mr. W. Brown, M.P., on the Advantages of his Proposed System of Decimal Coinage; 8vo., London, Hardwicke, 1855. A.
*Bishop, S. H.: Decimal Coinage Tables; London, Tallant and Allen, 1855. A.
*Borradaile, H.: Plan for adapting the Currency of India to a Decimal System of Accounts; London, Smith and Elder, 1855. C.
*Brown, W., M.P.: Answers to Fallacies; Balance of Trade Exchanges, and Common Coins; London, Rickerby, 1855. A.
Brown, W. M.P.: International Moneys; London, Rickerby, 1855. A.
*Crauford, J.: Memorandum on the Currency of the Straits Settlement; 4to., London, 1855. C.
*Debate in House of Commons, June 12, 1855. Hansard.
*De Morgan: Reply to Statements in Favour of a Tenpenny Unit in the *Times* City Article of May 3rd; London, Rickerby, 1855. A.
*De Morgan: Reply to Mr. Lowe's Speech in the House of Commons, June 12th, 1855. (Reprint of the Decimal Coinage Debate, by the Decimal Coinage Association.) A.
*Decimal Association: Address, with Petitions and Brief Explanations of Decimal System; March, 1855. A.
*Decimal Association: Address to the Chancellor of the Exchequer; 1855. A.
Fitch, J. G.: A Chapter on Decimal Money in Cornwell and Fitch's "Science of Arithmetic." London: Simpkin and Marshall, 1855.
*Franklin, J. A.: On the Expediency of at once Decimalising English Moneys and Weights. Paper read before the Society of Arts, Feb. 14, 1855; *Journal of the Society of Arts*, Vol. III., page 211. A.
*Franklin, J. A.: Decimal Money and Accounts as a Banker's Question; reprinted from the *Bankers' Circular*, May 12, 1855. A.
*Goddard: Four Letters on a Decimal Currency based upon the Crown; *Birmingham Journal*, May and June, 1855. A.
*Good, S. A.: Principles of a Decimal Coinage; *Journal of the Society of Arts*, May, 1855. A.
Good, S. A.: Synopsis of the Chief Proposals for a Complete Decimal Currency; also a Proposal for a Decimal Notation without altering the Present Coinage; suggestad by the Parliamentary Discussion of June 12th, 1855. Printed for private circulation.
*Gray, Dr. J. E.: On the Small Unit and the Comparative merits of the Three principal Decimal Systems, London, 1855. From the *Spectator*. B.
*Hare, J. Middleton, jun.: Letter to the Chancellor of the Exchequer; London, Ward and Co.; 1855. A.
Hoare: Decimal System for the Million; 1855.
*Jellicoe: An Examination of the Objections urged against the plan of Decimal Coinage proposed by the Royal Commissioners and by the Select Committee of the House of Commons. Paper read before the Institute of Actuaries, 26th March, 1855; *Assurance Magazine* for July. A.
*Minasi, F. J.: On the Basis of a Decimal System of Money for the United Kingdom. Paper read before the Society of Arts, Feb. 14, 1855; *Journal of the Society of Arts*, Vol. III., page 219. B.
*Minasi, F. J.: Lecture on Decimal Coinage, delivered before the Metropolitan Society of Schoolmasters, at Westminster, April 21, 1855. Printed in the *Journal of the Society of Arts*, Nos. 139, 140, and 141. B.
*Oliphant, G. H. H.: Proposed System of International Decimal Coinage; London, 1855. C.
*Paulson, K. J. W.: Decimalism, Part 1; London, Longman and Co., 1855. A.
*Rathbone, Theo. W.: Objections to Mr. Brown's Schemes, and Proposed Substitution of a more Simple and Practicable Plan; folio, 1855. B.
*Rathbone, Theo. W.: Letter addressed to the Honourable the Commons of the United Kingdom; Allerton Priory, 1855. B.
*Rationale of our present subdivision of the Pound Sterling, with Strictures on a Decimal Coinage. 8vo., London, Houlston and Stoneman, 1855.
*Reid, Hugo: On Decimal Coinage. Paper read before the Society of Arts, February 14, 1855. *Journal of the Society of Arts*, Vol. III., page 222. A.

*Sigma: Observations relative to the possibility of having an International Uniformity of Money; reprinted from the *Liverpool Mercury*; June 8th, 1855. B.

Stainton, J. J.: A Familiar Conversation upon Decimal Coinage, written especially for the Lower Orders; London, Cox, 1855. A.

*Turner, James H.: The Penny considered as the Foundation of a Decimal Currency; Cambridge, Macmillan and Co., 1855. B.

*Vining, C.: A System of Decimal Coinage and Currency, without Fractions; 8vo., London, Hamilton, Adams, and Co., 1855. B.

*Walford, C.: Decimal Coinage Familiarly Explained, with Tables; London, Pitman, 1855. A.

Young, Prof.: On the Decimal Coinage founded on the Farthing; Belfast, 1855. B.

*** The works marked thus (*) are in the collection of Dr. Gray, of the British Museum, who has also a very large and complete series of the Reports of Parliamentary Debates, Articles, Letters, &c., extracted from the different metropolitan and local journals from 1814 to this period. He would be obliged to any gentleman who would inform him of any work not in the above list, and for copies of any paper on the subject, as he is preparing a history of the discussions.

Home Correspondence.

THE WORKING CLASSES AND MECHANICS' INSTITUTIONS.

SIR,—I believe that the *non*-success of *some* Mechanics' Institutions may be attributed to the causes stated under the above heading in your *Journal* of yesterday. My experience of mankind has proved that poverty generally bends and gives precedence to wealth, and that therefore, when wealthy men introduce themselves, or are introduced, into the management of societies established for the benefit of the working classes, there is a considerable yielding of authority to them, which in numerous instances they neither require nor expect, and which is quite unnecessary on the part of the working man to give; this in time becomes a serious evil, and both the wealthy man and the working man become antagonistic, and retire from the society with disgust, which has either the effect of breaking it up altogether, or of seriously impairing its efficiency.

I once knew an Institution where working men formed three-fourths of the Committee, and yet it was *notorious* that one gentleman could carry every proposition which he introduced. The effects just stated, I am told, have been the consequence,—the Institution is now either a "very sick man," or is entirely defunct. I hold the working men who formed so large a majority responsible for so pusilanimously betraying their own manhood and the interests of the Institution.

Why "a sensible honest working man" should feel afraid or "uncomfortable" in the company of a man of wealth, simply because he is wealthy, is, I believe, owing to a defect in his early training, and is a problem which will only be successfully solved in the "good time coming;" then only *ignorance* and *vice* will hang their heads in shame in the presence of *educated intellect* and *virtue*.

As these thoughts have been suggested by reading the letter of Mr. Skinner, I shall perhaps be pardoned if I make a remark or two on the following sentences from his letter, before I proceed with other causes of the want of success of Mechanics' Institutions.

Mr. S. states that, "It is vain to suggest to the man of wealth and education, that he should endeavour to feel himself comfortable in the company of rags, dirt, and ignorance. Let Mr. Rymer ask himself if he would like, dressed in his superfine, to elbow his way through among dusty coats."

I am of opinion that a great want of the harmony which ought to exist among the members of these Institutions, arises in many cases from the jealousy of the working man against the good intentions of his richer neighbour; the spirit of the quotation bears me out in this assertion; here the man of "fine cloth" is made to elbow his way through among dusty coats, to look upon ignorance and rags with contempt, and I think, *very properly*, upon "dirt" with disgust; because a man is a working man this is no reason why he should appear at these places slovenly or "dirty;" and if the presence of respectable persons attending these unions have no other effect than to make such persons improve those habits, a great moral good is achieved; but, sir, I am happy in being able to add my testimony to the cleanly and generally orderly habits of the working classes at all the Institutions which I have visited and been connected with. In these gatherings I may have met with rags; I have met with ignorance, but I have never seen what may be termed a "dirty" person attending them, but in numberless instances they have been *scrupulously* clean.

But, to proceed, another cause of the want of success in these Institutions is their unavoidable secular character; and because they do not possess any strictly religious element, they are looked upon, both by ministers and the religious world in some localities, with a stronger feeling than in others, as seminaries of infidelity, and consequently the influence of these parties is strenuously opposed to them. It may be, and doubtless is true, that a few of the members in certain cases may hold those erroneous views, but there are, I believe, *few* committees to be found in this country who would sanction the dissemination of such pernicious doctrines; and whether or not, this is not a sufficient cause for the absence of ministerial influence, but is, on the other hand, a loud call for more active co-operation.

I have known Institutes, however, which could have enjoyed the membership and council of ministers, but for the custom of holding dancing parties and balls, which of course neither ministers nor professing Christians can sanction; this, I think, a very serious ingredient when introduced into any institution set apart for educational purposes; discord in a greater or lesser degree is certain to arise where these exercises are permitted.

In some other Institutions it is the custom, and a very excellent one if properly conducted, of setting apart some portion of the week for the discussion of topics voted by a majority of the members; but, excepting they are skilfully managed, and a respectful bearing cultivated, they degenerate into serious elements of discord, but where they are presided over by an intelligent mind, who is capable of detecting fallacious reasoning, and of giving a proper and healthy direction to their thoughts and arguments, then I can conceive them to be of immense benefit, but in the absence of these, I have known them to be of the most damaging character to the Institution.

Another serious drawback to their proper success in some cases is, the want of classes, and in others, the want of properly qualified teachers to conduct them when established, but the most serious difficulty that many Institutions have to contend with is, their inability to provide separate accommodation and teachers for young men and lads; this is of so serious a nature, that it is with great difficulty that young men can be induced to attend, and when they do, they are so afraid of their ignorance being seen by the junior members, that it is extremely difficult to teach them, nay, in some cases, utterly impossible; this feeling I conceive to be quite natural, and I am sorry that in so large a proportion of Institutions the necessity exists for it.

In one of the largest Institutions in Liverpool, where highly-qualified teachers are engaged, and which affords advantages few besides can offer, the classes are mixed; the consequence is, none but mere boys and youths attend.

Mr. Skinner is quite right as to the necessity of working men feeling and really having an interest in the management of such Institutions; but it is useless to disguise the fact that Mechanics' Institutions cannot be so successfully conducted without the aid of the purse and the social status of the wealthy man; and, as a *rule*, I am of opinion that those Institutions are the most flourishing, and do the greatest amount of real good to the neighbourhood where such is the fact. The more frequently the rich and poor can meet together, and that in so social a manner as at these Institutions, the more readily will they understand one another, seeing new beauties in each other's character, and eradicating many prejudices and much evil feeling.

I consider, for an Institution to be successful, it must be *definite* in its object, honest in its professions, and prospective in all its movements. If it be a society for the education of the masses, let it be so by every available means—by lectures, concerts, classes, reading-rooms, newsrooms, and good libraries—all of these if possible, or as many of them as are really practicable. If, on the other hand, it be a society for dancing and balls, let it be so, and allow the young people to dance until they are tired; but what I believe many Institutions have failed in is, by aiming at too much and doing but little, and that not well, and by introducing doubtful relaxations, losing thereby both character and status in the neighbourhood.

I am, Sir, yours very respectully,
JOHN HILL.

Educational Institution, Bootle, July 21, 1855.

GUNNERY.

SIR,—I crave your indulgence, and that of your readers, for I again address you on Gunnery, a subject with which I can be but little acquainted. My information is taken from papers left by the late Sir Samuel Bentham.

Amongst other improvements, he advised lining guns with different metals, to preserve the bore from rust; this might be done either by casting in, by braizing, or by soldering the metal; or by the insertion of a tube pressed in, *in vacuo*. Your correspondent, a Civil Engineer, proposes lining a gun with steel, but Sir Samuel suggested *cast steel* as the material for the gun itself, provided the price of that metal should not be too great. He had found by actual trial that, strength for strength, steel was not more costly than forged iron.

For the long period of 35 years, Sir Samuel vainly endeavoured to induce the Admiralty to institute a series of experiments on naval ordnance; but now that public attention is directed to the subject, it may be useful to Government, and to private persons employed in making experiments on firearms, to mention those he had in view, so far as can be collected from his papers. It may give confidence in his opinions to state that the flotilla he created at Cherson defeated in three separate actions a superior one supported by twelve ships-of-the-line, of which no less than nine were taken, sunk, or burnt. His flotilla was armed with guns of different descriptions—mortars, long guns, &c., from three-pounders to 18-inch howitzers.

The experiments indicated are as follows, and it will be apparent that most of them are applicable to the land as well as to the naval service.

What is the most efficient length of a gun?—It should be sufficient to afford space for the decomposition of the whole charge of powder before the shot quits the bore, but not so great as to produce unnecessary friction to the ball. What that length ought to be, has not yet been ascertained, though it may be known approximatively. For this experiment provide a gun of the greatest length in use, in proportion to bore, note the distance of range of the missile, then shorten the piece by two inches at a time, ascertaining the range on each successive trial. In this way will be determined the greatest distance to which a missile can be carried, and the comparative range according to the different lengths of the piece of artillery.

What is the thickness of metal necessary to prevent the bursting of a gun?—Take a piece of the greatest thickness in use, prove it, then diminish its thickness by degrees till it bursts. To that thickness should be always added a sufficiency of metal to ensure perfect safety, but this addition should be based on good grounds, instead of being arbitrary as at present. It is also desirable to ascertain whether the same thickness of metal be requisite along the whole length of the bore.

What is the smallest size of shot that can be thrown with good effect from a large gun?—It is important to know this, as the same aggregate weight of missile can be discharged with less trouble and labour from one large gun than from several small ones.

The great variety of ordnance now in use shows the need of the above experiments since the different lengths and weight of artillery "cannot *all* be right."

Can wrought iron ordnance be furnished, strength for strength, at the same price as cast iron?—This is more a question of expense than of experiment.

Experiments on balls.—Sir Howard Douglas has shown that those of an *ovoid* form pass more easily through air than globular ones, but his experiments do not determine the precise form that is least obstructed by the atmosphere. The continuance of the flight of a shot, in the desired direction, depends on the position of its centre of gravity as well as on its form. There is another point to be considered, namely, what it has to destroy. The same form of missile will not batter a stone wall that would easily pierce a ship's side. A single bullet might effect the latter purpose, but would not be so destructive of men, sails, or rigging, as the same weight of shot divided into many parts. Many varieties of shot producing various effects are in use, but a sufficient assortment is rarely furnished, especially to vessels of war.

The charge of powder that different guns will bear has not yet been accurately determined, and to the small quantity allowed for a carronade may principally be attributed the disuse of that species of ordnance; for it was found in long continued actions that the carronade would bear a much larger charge of powder; indeed, on one occasion at least, enough to discharge *three* balls at once without damaging the piece.

The form and dimensions most suitable for the *chamber* of a gun require experiment.—Should a space be allowed between the cartridge and the missile, or should they touch? What part of the cartridge should be first ignited, whether close to the missile, in the middle, or at the end nearest the breech of the gun.

Windage is well known to be highly prejudicial; to prevent it, the balls might be cast with a groove round them, this groove being filled either with a strip of soft metal, or with bands of some such thing as woollen; wads would then be no longer necessary, and the saving would probably compensate for the extra expense of the ring. There might be some amount of care required for loading a gun, but not so much as in loading a rifle.

Sir Samuel indicated many precautions that he thought essential in making gunnery experiments. Each one might be repeated five times to ensure certainty of result; the piece of ordnance should always be brought to the same temperature; the bore should be perfectly cleansed; the shot should be of the same diameter, weight, and specific gravity; other precautions which are always adopted in the present advanced state of science and accuracy of experiment, need not be mentioned.

The great variety of gun carriages in use indicates that hitherto they have not been constructed on any fixed principle. They should be fastened strongly enough to resist the shocks occasioned by explosion; they should not rest on rollers or wheels, so that no deviation from the aim taken should be caused by motion of the carriage. To facilitate the training of a gun, it should, when

needed, be supported on handspikes with rollers on their lower ends. Rolling handspikes were brought into general use by Sir S. Bentham early in this century.* Moreover, if the platform be not of hard materials, it is gullied by wheels or rollers, as is frequently seen in the decks of vessels.

Your correspondents, Mr. Bridges Adams and Cosmos, may probably point out many other experiments in gunnery, besides those indicated in these notes, as they are so well acquainted with the subject, and enter into the *rationale* of it.

Cosmos appears to aim at perfection in ordnance. General Bentham aimed at the practicable. The former advocates large and heavy guns, even of greater size than those which throw stone shot at the entrance of the Dardanelles; General Bentham was well aware that a long gun carried further than a short one, and that the weight diminished the recoil, but he considered also, that however deep the public purse may be, still it is too shallow to afford any other outfit than such as would, on the average, most annoy the enemy at the least possible outlay of men or money. Though convinced of the superior efficacy of long guns, yet when permitted by the Admiralty to build and arm half-a-dozen vessels according to his views, he armed them with carronades and other short artillery, considering that most of the missiles thrown to a great distance, fail to hit the object aimed at, and that, therefore, naval actions must generally be at close quarters. The success of his sloops and schooners in actual warfare proved the soundness of his views. They took numerous prizes, although armed with nothing better than carronades, and having but slender complements of inferior men. As shell would be thrown with greater effect from a long gun than from a mortar, it might be desirable to provide large pieces of ordnance for battering a fortress.

What Cosmos says of the inertia of a gun seems to militate against Captain Roberts's mode of fitting mortars, for it is evident that the inertia is diminished by the recoil, whereas in the old method it had no other recoil than that of the vessel itself through the water, this being estimated by Mr. Fairbairn as next to nothing.

The same correspondent further observes that "It is not by taking things for granted on by-gone knowledge that the new and essential can be attained." Opinions of from 25 to 70 years old would not, then, be useful at the present day; but the circumstance of our long peace renders still available the ideas of a person who, from his official position, was enabled to witness the effects of the last war on our fleets and on private trade. His views as to warfare, although not appreciated at the time, are now found to be correct, and are being, in many instances, adopted. Government scouted the idea of shallow vessels —they now find the need of them; they used no other ordnance than long guns—they now cause ships' boats to be heavily armed with short ones. In the Sea of Azoff, our victories have been gained, not by ships-of-the-line, but by vessels of the lightest draught of water. The *Lady Nancy*, a mere raft, constructed in a single night, has proved of the greatest service.

It is quite true that experiments carried on at Woolwich by such men as Sir Howard Douglas, would be far preferable to those tried in Manchester. They can nowhere be carried on so satisfactorily as on Government premises, so as to combine economy with certainty of good results. As to economy, preparations for one set of experiments would frequently be useful for another series. It would be difficult in Manchester to find a suitable range of ground for experimenting; no such difficulty would exist at Woolwich.—I am, Sir, very truly your's,

M. S. BENTHAM.

A letter sent to the Admiralty being on Gunnery, a copy of it is annexed:—

To the Secretary to the Admiralty.

SIR,—As the enemy appears to make much use of the rifle, it would seem more desirable than ever to protect our seamen from its shot; I, therefore take the liberty of requesting you to lay before the Lords Commissioners of the Admiralty a plan devised by the late Sir Samuel Bentham, which after much consideration, he conceived to be the most practicable of several modes that had occurred to him for effecting the purpose.

Sir Samuel's expedient was as follows:—

That in fitting ordnance there should be attached to their carriage, by means of a ball and socket joint, a shield closing the whole port of a ship excepting the mouth of the gun and an aperture sufficiently large for taking aim.

I am, Sir, your obedient servant,

(Signed) M. S. BENTHAM.

ON THE CHEMICAL PURIFICATION OF TOWNS AND CITIES.

SIR,—Liebig and others have made known to us analytically, a process in nature, long known empirically to most cultivators of the earth, viz., that the excretions of animals are the food of plants, while many kinds of plants are the food of animals, being, in fact, a kind of natural alembics for reconverting the excretions to serve again as animal food.

When large numbers of human beings aggregate together these conditions are lost sight of. The natural processes of absorption in the hunting or nomadic condition of man are altogether changed, and what should be the food of vegetables becomes simply a nuisance and a waste, till the enormity of the nuisance amongst more civilised communities generates various means of causing the carrying powers of nature to get rid of it, and without which, in the absence of better knowledge, large cities would be, and are, centres of constantly recurring plague. Thus we find that cities with large rivers—large proportioned to the numbers of their inhabitants—are, notwithstanding many disadvantages of low alluvial bottoms, far healthier than cities without rivers; and thus we find that camps without drainage are generally centres of disease.

Rome, in its palmy days of dense population, would have been uninhabitable without its *cloaca maxima*, and that would have been useless without its Tiber. How far the unhealthiness of southern towns may be due to the absence of tide in the Mediterranean, is a problem worth inquiring into. Rivers may be carriers, but the Mediterranean sea is not; and whoever has lived in Marseilles, and frequented the harbour during the hot months, has had painfully called to his mind the reflection, that for centuries have the excretions of the town being pouring into a tideless salt-water pond, forming a mass of filth analogous to our own Thames, and, like it, stirred up incessantly by paddle steamers, and, worse still, by the screw steamers, that stir up lower deeps, delving in a pit of Acheron of the foulest blackness, a fetid blackness, compared with which the Stygian blackness of the Aire and Irwell is as the meads of Enna. And the Bay of Cadiz, exposed to the Atlantic tides, is in a similar condition. Constantinople and the cities of the East, wherever the tideless sea stretches, are the perennial abodes of plague and cholera, save where, as at Nice, the inhabitants avoid pestilence and barrenness at the same time by the economical appropriation of the excretions not suffered to accumulate in too large masses. The conditions of pestilence vary with climate and locality. With a hot sun, dry air, and porous soil, desiccation takes place immediately; with warmth and moisture, putridity is generated rapidly, and even the desiccated substance is capable of being again changed into a noxious condition. If ever the time shall come that the Eastern towns fall into the hands of people of energy, the under-sea deposits of places like Marseilles will be dredged in the winter season, and the rich harvest

* This invention is attributed, erroneously, to the French Engineer, Paixhans.

of coprolute will become a world-wide discovery more extended than guano. What the guano islands have been to sea birds, rivers and sea creeks have been to the inhabitants of the bordering cities, and the time may come that Anglo-Saxon contractors will compete with each other for the guano diggings of the long-shore regions of the Thames. And when these are dug out, they will rush to obtain the concessions of the deposits of rich Venice and richer Amsterdam.

For many years Brighton, Hastings, Sandgate, Margate, and similar places, possessed pure air. Numbers thickened with the temptation, and now, who can walk on their respective beaches without being disgusted, if not poisoned, with that which is "in a wrong place!" The sea cannot be made a carrier of that which nature has ordained for other uses. If the sewer pipes be carried to low-water margin their contents are strewed along the beach. If they be carried into the sea beyond, they are stopped with shingle. Even if we try to suspend them, "like Mohammed's coffin, between heaven and earth," by slinging them to buoys with elastic joints, even then they will pollute the water, and bathing can only be practised to tideward of their mouths. The salt sea was not intended by nature to be a pickling tub for the refuse of slatternly Health of Towns Commissioners, a mud bin for the reception of wasted household material.

Careless and idle housemaids are proverbially fond of sweeping dirt into dark corners, and letting it lie there. It was once my evil fortune to make a passage in a vessel, part of whose hold was improvised into cabins for steerage passengers by forming a deck with loose planks, the joints of which were open, like the station platforms on the Dover Railway, since imitated in the Crystal Palaces. The women soon found that it was much easier to throw water and sweep dust down the cracks than to carry them up the hatchway, and throw them overboard; and thus began a feud with the mate, who was incessantly on the watch to stop them from, as he phrased it, "losing" dirt and water in the hold. But it was unavailing, all his time was taken up like a policeman, and he resorted to an Act—and not a Parliament—deed, not word—caulking the planks, and cutting of the inboard drainage.

In the earliest river settlements, the inhabitants of the dwellings found the stream so convenient a carrier that they threw all their "dirt" into it. As dwellings thickened and receded from the river, the inhabitants dug holes called "cess" or collective pools, to save themselves a daily journey to the river. Water overflowed the cess-pools, and it became essential to score the surface of the ground to help it in its course to the river. Becoming an olfactory nuisance in time, these scores, or surface drains, were covered over, and became sewers. Increase of cesspools with the increase of population choked the sewers, and—in London at least—Acts of Parliament were passed prohibiting any communication between privies and sewers.

Water-closets were then invented, water carriage by the open river indicating the convenience of water carriage in drains; and during all this time it seems not to have occurred to mind that the excretion nuisance was not really got rid of by simple removal to another place. It grew and increased mightily, pervaded our houses and our streets, and worked up through gully holes. And then the Board of Health proclaimed aloud that it was all for want of water enough. And water was added, and the drains and sewers were cleansed, and then came the discovery that all this time we had simply been converting the river itself into one huge sewer, a nuisance open to everyone's eyes and nostrils.

Another outcry now comes, that no drainage is to be permitted into the river, but that all sewage shall be carried in closed sewers along the banks of the river, and be deposited in the marshes of Kent and Essex. But this is simply removing the pestilence to a certain distance, to be borne back to us on the breath of the wind when setting towards us, or poisoning some other portion of the population in other directions.

The next remedy is to deodorise and dry the total collection in these same marshes; and here, at last, we arrive at something tangible.

Owing to our bad construction of houses, and to our preference for small pipes, buried in walls and elsewhere for purposes of secrecy, and our use of water as a lazy though not gratuitous carrier, we convert every cubic foot of excretions into many cubic feet of poisonous liquid. We may get it to the Essex marshes in that mode, but we have then to evaporate the water, previous to drying and deodorising.

Why, then, should we not begin at the beginning, and keep away water from it altogether. The answer is that the vicious practice of putting all our excretions into dark places and narrow corners has necessitated the use of water to make cleaning accessible. Capable housewives always look to the dark places about their houses; the light portions are sure to be right.

The cess-pool, in its original intention, was right. It was the collection for the day or week, and had it been confined to that, chemistry would long since have dealt with it, on account of the frequent recurrence of a trouble. In Manchester, where I believe there are scarcely any water-closets, the practice is to throw the daily ashes among the soil in layers, and thus partly absorb it, and frequently remove it without additional liquid, in a condition satisfactory to the farmer.

Our old cesspools, like those of Paris, were made to gather the collections of years. Commonly they were made of permeable brick, and that which might be convenient on a farm became insufferable in a city. The construction of sewers of porous brick also tended to choke them, and they were christened by the name of "elongated cess-pools." To remedy this difficulty vigorous attempts were made to supply the place of brick sewers by glazed earthen pipes of small diameter, and needing comparatively little water. Now, supposing the absence of all contingencies of stoppage by housemaids' brushes and other matters, there was one insurmountable difficulty in these drains being placed under ground and out of sight, and, consequently, inaccessible save by workmen.

In all cases of drainage, the first consideration is that the drains should be accessible to, and capable of being cleaned by, the servant of the house, and, therefore, they should be in sight.

But, it will be said, that this precludes the use of close and trapped drains.

This does not follow. It would be easy to place earthen or other drains in a trunk of brickwork, and to have water traps to the drain-pipe at frequent intervals, so as to make the whole course accessible to an elastic rod or brush. But this brings us to the consideration of the different waste materials we have to deal with.

First.—The indirect materials used for the body—washing water, cooking water, refuse food, animal and vegetable.

Secondly.—The direct excretions of the body.

Thirdly.—Ashes and dust, the refuse of fuel.

There is no reason why soapy water and greasy water should not run down ordinary drains, unless they be useful to sell, in which case they would not be a nuisance to carry away. Putrid vegetable water should be dealt with chemically before running into the drains.

The direct excretions of the body cannot be properly dealt with in our present fashion of houses, neither can refuse food, animal or vegetable. Cabbage leaves and refuse must go into the dust-hole along with the refuse fuel, and the result is frequently obnoxious, owing to the want of proper disinfectants.

As chemistry has been sucessful in converting filthy potatoe oil and coal tar into delicate perfumes, it is no doubt chemically possible to convert all the waste material of a household into innoxious and not unpleasant substances. Two considerations are requisite;—first,

that it be cheaply done; secondly, that it may not diminish the value of the materials as a manure, by locking up, as it were, the ingredients so firmly, as to render them insoluble in the ground for the purposes of vegetation.

In this mode, and by no other mode, by chemical conversion, and not by mere mechanical transport, must the ultimate purification of cities be brought about. If this conversion is deemed practicable and profitable on the larger scale, it will be found much more convenient on the small scale, converting the matter before it leaves the houses, and not subsequently.

To accomplish this is the business of the chemists. If the same skill and energy be put to work that has accomplished the conversion of other noxious substances into perfumes, we shall not long be at a loss. For towns with ample water supplies, we may put this off; but for inland towns without water there is no other remedy. We need a chemical neutral, cheap in itself, or at any rate of such a quality that it will possess an equivalent value when put on land.

I think that if the Society of Arts bestirs itself to impress this on its members, we shall soon be as well supplied with disinfectants, at a cheap rate, as with colour-boxes and microscopes.

The next question is, how to use them, and to ensure their use.

To use the disinfectants we need portable cess-pools, without the access of water on the ordinary plan of closet, in which cesspool or vessel the disinfectant may lie. It should be a vessel on wheels, at a level with the yard of the house, and beneath the opening of closet or closets, with ample space, so that falling matter may certainly pass clear of the walls. The disinfectant should be in a liquid form, thoroughly to mingle with the offensive matter. These cesspools should be furnished by companies, who would take them away with their contents, to discharge into covered railway waggons or barges, and replace them with empties. In this mode the material, undiluted with water, would be transported cheaply, and be as readily saleable as guano.

To ensure the use of the disinfectants, the material might be a servant's perquisite, and there is no reason why the receptacle for family excretions should not be as cleanly and orderly as the receptacles for family increment in the shape of food, as the beer cellar or wine cellar, and in addition it should be thoroughly light.

With these arrangements—perfect chemical neutralisation—instead of the pretence of the thing—sewers would not be needed save for rain and impure water.

But, it will be answered, this will need houses to be built on purpose, or very extensive alterations! No doubt; but there is a simple way of making the plan self-acting. Put the sewer's rate on such houses as communicate with them by water-closets, and free those properly fitted to disinfect and carry away the excretions. Districts undrainable in the ordinary sense, might thus be rendered comparatively wholesome, and builders of new streets might be permitted to erect dwellings, without incurring the expense of underground drains.

So long as we shall persist in the practice of making drains for filth beneath the surface, and hiding obnoxious substances in dark corners, so long shall we be afflicted with insidious nuisances. Putrid odours are not the less fœtid when they ascend through gully-holes at intervals. Destroying the putrefactic germ by air and light, and chemical action, is a more logical process than trying to "lose" it in the river.

Let, then, the Society of Arts "poke their noses"—as Earl Granville has it—into this matter, and my life on it they will set the chemists earnestly to work, and in a short time the pages of their Journal will teem with communications, giving the public the choice of many cheap disinfectants, besides peat charcoal and chloride or sulphate of zinc; perhaps, also, a model or two of improved house arrangements, with portable cesspools, that may lighten our present darkness. If we run up the cost of our present system of closets, and drains, and sewers, and their non-efficiency, we shall find the disinfectant process and transport by railway the least outlay and the largest economy with the best result.

I am, sir, your constant reader,

W. BRIDGES ADAMS.

1, Adam-street, Adelphi, August 9, 1855.

THE RAW PRODUCE OF BRITISH HONDURAS.

Belize, British Honduras, June 15th, 1855.

SIR,—I am happy to say that twelve tons of cahoun nuts have been shipped on board the *Elphinstone*, a vessel belonging to Messrs. Hyde and Co., of London, which sails to-day for that port. A like number will be sent in another vessel in a very short time, and I have also forwarded to Mr. Wilson a large box of those nuts, and six bottles of cahoun oil. There is now a certainty of this article being fairly tested, and the fact ascertained, whether or not it is likely to become a valuable addition to our commerce. I am, myself, sanguine that the experiment about to be tried will be attended with the most satisfactory results. Should the oil obtained from the nuts now sent be found to be very superior to cocoa-nut oil, the next questions will be—1st. What kind of machinery will be the best adapted for the manufacture of it with expedition and economy; and, 2ndly, whether will it be better to export the nuts to England to be there manufactured, or to have the necessary machines sent here for the purpose of expressing the oil in this country. With respect to the first question, I have no doubt there are many scientific members of your Society who will, with great pleasure, turn their attention to the subject, and offer their suggestions. Should any be so disposed, Messrs. Hyde and Co., 2, Great St. Helen's, Bishopsgate-street, would gladly avail themselves of their counsel, and furnish them with the nuts requisite to enable them to form an opinion. The second question will require much serious consideration. A great deal may be said in favour of either alternative. If the oil were manufactured on the spot, there would be, I think, a saving in freight, not only on account of the oil being less bulky than the nuts—for the oil obtained from a ton of nuts would of course occupy a much smaller space than that quantity of nuts in their natural state,—but also on account of the great number of nuts which the manufacturer would be compelled to reject, either because they were not sufficiently full, or because they were too old. If the oil were manufactured in England, these bad nuts would pay freight equally with the good ones. It is true that, at present, the freight of the nuts is only one pound per ton, while the freight of the oil is three pounds. But this inequality arises from the fact that the nuts can now be sent to England as broken stowage between the logs of mahogany. But I apprehend that the day is not far off when mahogany will cease to be the staple commodity of this country, and cahoun nuts and cocoa nuts will have to be shipped as regular cargo. On the other hand, if the nuts were exported to England, there would be the advantage of having the most complete machinery, engineers to repair it when out of order, and cheap labour, besides the aid of those whose attention has long been directed to the manufacture of oils. Upon the whole, I think the advantages preponderate on the side of home manufacture.

A doubt has been raised whether there are sufficient nuts to supply the British market to a large extent. I have already said, and the crown surveyor, Mr. Faber, who is a very scientific and intelligent man, and has visited most parts of Honduras, has also declared, that there are sufficient nuts to supply the British and other markets to an unlimited extent. Those who profess to doubt the plentifulness of these nuts, admit that there are millions of cahoun trees, but they say that not one-half of them bear fruit. Now this is *partly* right and *altogether* wrong. It is correct to say that a very great number of the trees now

growing do not bear fruit, but it is quite erroneous to say that they are not capable of bearing. The fact is, the trees are so numerous, they grow so quickly, they are so closely packed—so much so, that it might be said with no great impropriety that they are not able to breathe—that, from this circumstance alone, very many of them do not bear fruit. There is, in truth, in many instances, what may be termed a barren exuberance. As the trees are constantly shedding their nuts, and there being no one to gather them, it follows as a matter of course that young trees are ever springing up on all sides, until the whole country round becomes a vast leafy wilderness, "an endless contiguity of shade." If the cahoun trees were male and female, like most of the palm tribe, many of course would not bear; but there would then be a known cause for this default. But they are not male and female, and there *can* be no other cause but the one which I have mentioned. I have sent you a small sketch of a cahoun ridge, executed by Mr. Faber. It is a correct representation as far as it goes, but I will endeavour to procure a more complete drawing to be made.

I observe in your catalogue that amongst the desiderata of your society are samples of ornamental woods suitable for furniture. This country contains a vast variety of woods, both of an ornamental description, peculiarly adapted to cabinet ware, and of a solid and durable nature, fitted for ships, buildings, railway sleepers, and a number of other purposes. I will procure a list of all the woods which are known to exist in this country, and, if possible, specimens of them, and forward them to the Society. But the wood which has hitherto occupied the attention of the settlers, not only to the exclusion of all other wood (except logwood), but of all other considerations, is mahogany. King Log has hitherto ruled with despotic sway. But his reign is nearly over, and the benignant nut, I trust, will succeed to the throne, and, casting his oil upon the troubled waters, will cause a commencement of prosperous and *palmy* days.

When mahogany was first introduced into Europe, is not known with any degree of certainty. It is by some supposed it was first discovered in the island of Trinidad, by the carpenter of one of Sir Walter Raleigh's vessels. The story goes, that the ship requiring some repairs, this officer went on shore to look for some wood for the purpose, which, having found, he cut and brought on board. When he came to work it up, he was surprised at its hardness and beauty. This story deserves little credit. The circumstance could not be transmitted to us without its having been known to many persons at the time, and if the wood were so beautiful, it is not probable that, in the reign of Elizabeth, when there were so many enterprising navigators, and such a raging thirst for the riches of the New World, such a valuable tree would have been left to blossom and decay unmolested in its native forest. We do not hear of mahogany having been made use of in England until the beginning of the present century. It is said that a Dr. Gibbons, of London, had a brother who was master of a vessel trading to the West Indies. This worthy skipper, hearing that his brother was building a new house in King-street, Covent-garden, very fraternally sent him a quantity of wood, which he had brought in his ship as ballast. This wood was so hard that the carpenters could not work it up, and it was thrown aside as useless. But one day Mrs. Gibbons, who it appears was a thrifty dame, and did not approve of burning candles at both ends, resolved to have a box made, in which those illuminators might be safely kept, and every fragment thereof carefully preserved, and she selected a piece of this rejected wood for the purpose—which turned out to be mahogany. When it was made it was so beautiful, and the Doctor was so enchanted with it, that he determined to have a bureau made of the same material, in which *he* might keep his money. When the bureau was finished, it was shown to the Duchess of Buckingham, who was equally charmed, and she also determined to have a case made in which *she* might keep her jewels.' By these quick gradations, from the candle-box of a citizen's wife to the casket of a peeress, mahogany became known in England. But this story has a fabulous air with it, for it is hardly likely that the captain of a West India trader, laden with sugar and rum, and also much spice, would take a quantity of *wood* into his ship for *ballast*.

The manner of cutting mahogany, trucking it, squaring it, and floating it down the river to the sea, are well described in an old almanac. The account is rather long, but it is very interesting; I will not apologise for giving you the following copy of it:—

"The season for cutting the mahogany usually commences about the month of August. The gangs of labourers employed in this work consist of from twenty to fifty each, but few exceed the latter number. They are composed of slaves and free persons, without any comparative distinction of rank; and it very frequently occurs, that the conductor of such work, here styled the captain, is a slave. Each gang has also one person belonging to it termed the huntsman. He is generally selected from the most intelligent of his fellows, and his chief occupation is to search the woods, or, as it is called in this country, the bush, to find labour for the whole. Accordingly, about the beginning of August, the huntsman is despatched on his important mission, and if his owner be employed on his own ground, this is seldom a work of much delay or difficulty. He cuts his way through the thickest of the woods to some elevated situation, and climbs the tallest tree he finds, from which he minutely surveys the surrounding country. At this season the leaves of the mahogany trees are invariably of a yellow reddish hue, and an eye accustomed to this kind of exercise, can, at a great distance, discern the places where the wood is most abundant. He now descends, and to such places his steps are directed—and, without compass, or other guide than what observation has imprinted on his recollection, he never fails to reach the exact point to which he aims. On some occasions no ordinary stratagem is necessary to be resorted to by the huntsman, to prevent others from availing themselves of the advantage of his discoveries; for, if his steps be traced by those who may be engaged in the same pursuit, which is a very common thing, all his ingenuity must be exerted to beguile them from the true scent. In this, however, he is not always successful, being followed by those who are entirely aware of all the arts he may use, and whose eyes are so quick that the lightest turn of a leaf, or the faintest impression of the foot is unerringly perceived—even the dried leaves which may be strewed upon the ground, often help to conduct to the sacred spot—and it consequently happens that persons so engaged, must frequently undergo the disappointment of finding an advantage they had promised to themselves seized on by others. The hidden treasure being, however, discovered, the next operation is the felling of a sufficient number of trees to employ the gang during the season. The mahogany tree is commonly cut about ten or twelve feet from the ground, a stage being erected for the axe-man employed in levelling it; this, to an observer, would appear a labour of much danger, but an accident rarely happens to the people engaged in it. The trunk of the tree, from the dimensions of the wood it furnishes, is deemed the most valuable, but for purposes of ornament, the limbs, or branches, are generally preferred, the grain of them being much closer, and the veins more rich and variegated. A sufficient number of trees being now felled to occupy the gang during the season, they commence cutting the roads, which may fairly be estimated at two-thirds of the labour and expense of mahogany cutting. Each mahogany work forms in itself a small village on the banks of a river—the choice of situation being always regulated by the proximity of such river to the mahogany intended as the object of future operations. In the arranging of the habitations, much rural taste is often displayed, and it is highly gratifying to the curious to remark the different modes peculiar to the several nations or tribes of Africa,

as also the improvement introduced by European experience in the construction of the houses, among which the proprietor's residence, with store-houses, cattle-sheds, &c., invariably form a conspicuous figure—those of the different labourers being usually of more humble appearance, but all built of the same material, which the surrounding country affords in abundance. We have frequently seen houses of this kind completed in a single day, and with no other implement than the axe, consequently every workman is capable of performing the labour required to build his own dwelling. After completing this establishment, a main road is opened from it, in as near a direction as possible to the centre of the body of trees so felled, into which branch or wing roads are afterwards introduced, the ground through which the roads are to run, being yet a mass of dense forest, both of high trees and underwood. They commence by clearing away the latter with cutlasses, which, although in appearance a slender instrument, yet, from the dexterity with which it is used, answers the purpose admirably. This labour is usually performed by task-work, of one hundred yards each man per day, which expert workmen will complete in six hours. The underwood being now removed, the large trees are then cut down by the axe, as even with the ground as possible, the task being also at this work one hundred yards per day to each labourer, although this is more difficult and laborious, from the number of hard woods growing here, which, on failure of the axe, are removed by the application of fire.

"The trunks of these trees, although many of them are valuable for different purposes, such as bullet tree, iron-wood, redwood, sapodilla, &c., are thrown away as useless, unless they happen to be adjacent to some creek or small river, which may intersect the road; in that case they are applied to the constructing of bridges across the same, which are frequently of considerable size, and require great labour to make them of sufficient strength to bear such immense loads as are brought over them.

"The quantity and distance of road to be cut each season depends on the situation of the body of mahogany trees, which, if much dispersed or scattered, will increase the labour and extent of road-cutting; and it not unfrequently occurs, that miles of road, and many bridges, are made to a single tree, and that may ultimately yield but one log. The roads being cleared of all the brushwood, still require the labour of hoes, pick-axes, and sledge hammers, to level down the hillocks and to break the rocks, also such of the remaining stumps as might impede the wheels that are hereafter to pass over them.

"The roads being now all in a state of readiness, which may generally be effected by the month of December, the cross-cutting, as it is technically called, commences. This is merely dividing crosswise, by means of saws, each mahogany tree into logs, according to their length, and it often occurs, that while some are but long enough for one log, others, on the contrary, will admit of four or five being cut from the same trunk or stem, the chief guide for dividing the trees into logs being to equalise the loads the cattle have to draw, and prevent them being over-burdened; consequently, as the tree increases in thickness, so the logs are reduced in length; this, however, does not altogether obviate the inregularity of the loads, and a supply of oxen are constantly kept in readiness to add to the usual number, according to the weight of the log; this becomes unavoidable, owing to the very great difference of size of the mahogany trees, the logs taken from one tree being about 300 feet, while those from the next may be as many thousands; but the largest log ever cut in Honduras was of the following dimensions:—Length, 17 feet; breadth, 57 inches; depth, 64 inches; measuring 5,168 superficial feet, or 15 tons weight. For bringing to view this extraordinary specimen of the production of nature, we are indebted to the persevering exertion and ingenuity of Charles Craig, Esq., an eminent and experienced mahogany cutter.

"The sawing being now completed, the logs are separated one from another, and placed in whatever position will admit of the largest square being formed, according to the shape which the end of each log presents, and is then reduced, by means of the axe, from the round or natural form, into the square, although some of the smaller logs are brought out in the round; yet, with the larger description, the making them square is essential not only to lessen their weight, but also to prevent their rolling on the truck or carriage.

"We now reach the month of March, when all the preparation before described is, or ought to be, completed—when the dry season, or time of drawing down the logs from the place of their growth commences, which process can only be carried on in the months of April and May, the ground during all the rest of the year being too soft to admit of a heavily laden truck passing over it without sinking, and, although the rains usually terminate about February, yet, from the ground being so soaked with rain, the roads are seldom firm enough for use till the first of April.

"The mahogany cutter's harvest may be at this time said to commence, as the result of his season's work depends on a continuance of the dry weather, for a single shower of rain would materially injure his roads. It is, therefore, necessary that not a moment should be lost in drawing out the wood to the river.

"The number of trucks worked is apportioned to the strength of the gang, and the distance, generally from six to ten miles. We will, for example, take a gang of forty men, capable of working six trucks, each of which requires seven pair of oxen and two drivers, sixteen to cut food for the cattle, and twelve to load or put the logs on the carriages, which latter usually take up a temporary residence somewhere near the main body of the wood, it being too far to go and return each day to the river side, or chief establishment. From the intense heat of the sun, the cattle would be unable to work during its influence, consequently, they are obliged to use the night time in lieu of the day, the sultry effects of which it becomes requisite to avoid. The loaders, as before-mentioned, being now at their station in the forest, the trucks set off from the barquedier about six o'clock in the evening, and arrive at their different places of loading about 11 or 12 o'clock at night. The loaders being at this time asleep, are warned of the approach of the trucks by the cracking of the whips carried by the cattle drivers, which are heard at a considerable distance. They arise, and commence placing the logs upon the trucks, which is done by means of a temporary platform, laid from the edge of the truck to a sufficient distance upon the ground, so as to make an inclined plane, upon which the log is gradually pushed up from each end alternately. Having completed their work of loading all the trucks, which may be done in three hours, they again retire to rest till about nine o'clock next morning. The drivers now set out on their return, but their progress is considerably retarded by the lading, and although well provided with torch-light, they are frequently impeded by small stumps that remain in the road, and which would be easily avoided in daylight; they, however, are in general all at the river side by 11 o'clock next morning, when, after throwing the logs into the river—having previously marked them on each end with the owners' initials—the cattle are fed, the drivers breakfast and retire to rest until about sunset, when they feed the cattle a second time and yoke in again. Thus goes on the routine of trucking during the season, the loaders being employed in the interim preparing the logs for the return of the trucks.

"Nothing can present a more extraordinary appearance than this process of trucking, or drawing down the mahogany to the river. The six trucks will occupy an extent of road of a quarter of a mile—the great number of oxen—the drivers half naked (clothes being inconvenient from the heat of the weather and clouds of dust), and each bearing a torch-light, the wildness of the forest

scenery, the rattling of chains, the sound of the whip, echoing through the woods, then all this activity and exertion so ill-corresponding with the silent hour of midnight, makes it wear more the appearance of some theatrical exhibition than what it really is—the pursuit of industry which has fallen to the lot of the Honduras wood-cutter. About the end of May the periodical rains again commence. The torrents of water discharged from the clouds are so great as to render the roads impassible in the course of a few hours, when all trucking ceases; the cattle are turned into the pasture, and the trucking gear, tools, &c., are housed.

"The rain now pours down incessantly till about the middle of June, when the rivers swell to an immense height; the logs then float down a distance of 200 miles, being followed by the gang in pitpans (a kind of flat bottomed canoe), to disengage them from the branches of the over-hanging trees until they are stopped by a boom placed in some situation convenient to the mouth of the river. Each gang then separates its own cutting, by the marks on the ends of the logs, and form them into large rafts, in which state they are brought down to the wharves of the proprietors, were they are taken out of the water, and undergo a second process of the axe, to make the surface smooth; the ends, which frequently get split and rent, by being dashed against rocks in the river, by the power of the current, are also staved off, when they are ready for shipping."

In the extract above quoted, mention is made of a canoe called a pitpan. In Honduras there are three descriptions of boats. One is called a dorey; this is a sort of a canoe, which is cut out of one log of wood (sometimes mahogany, sometimes cedar); this boat is considered to be very safe, and is well adapted to the waters in which it is intended to float; it is sometimes very small, but the negroes and the Caribs, especially the latter, are very dexterous in the management of it; it is invariably impelled by means of paddles—oars, indeed, would be useless in the narrow streams which the wood-cutters are frequently obliged to navigate. Another species of boat is called a creah; this is a raised dorey, that is, the portion which consists of the hollow log is built upon, partially decked, and rigged for sailing; they cut through the water with great rapidity, but they are very dangerous, being apt to be capsized by a sudden puff of wind upon the quarter, from the narrowness of the beam in comparison with their length and height. The pitpan is a long, flat-bottomed boat, deep and wide in the middle, but shallow at the ends, which are square; some of them are fitted with a wooden awning, which, however, can be removed at pleasure; it is also made of one log of wood, generally mahogany. The pitpan can only be used in the rivers—it would be swamped immediately in a heavy sea. At Christmas there are pitpan races between the negroes and the Caribs, and one pitpan not unfrequently contains fifty or sixty paddlers. It is a singular spectacle—this pitpan race. The enormous length of the boat—the great number of paddlers, with their dark bodies naked to the waist—their broad brawny chests and muscular backs and arms—their shrill, dissonant, ferocious cries, their wild gestures, sometimes plying the paddle with inconceivable vigour, which sends the canoe with the swiftness of an arrow throw the water, causing it to leave in its wake a thick milk-white foam—sometimes hurling it into the air, and dexterously catching it as it falls, and sometimes dashing up the spray, which for a moment makes them nearly invisible—present altogether a scene as different from those which are usually witnessed in civilised countries as can well be imagined.

I hope to be able to send you a model of a pitpan by the next packet.

I have now forwarded to you a sample of the snake root. This is thought by some persons to be the guaco, but it is not. It is, however, much confided in as a remedy for the bite of a snake. An infusion, or tincture of this root, is exceedingly bitter, and I have no doubt it would prove an excellent tonic.

The chew stick is, I believe, common to the whole of the West Indies; the negroes use it for polishing their teeth, and it must be admitted that its effect upon Sambo's incisors is quite wonderful. That highly respectable descendant of Ham generally possesses a set of masticators so white, so sharp, so glittering, that though perhaps his great progenitor, if he were to appear, might escape them, few modern hams would have the least chance. But the chew stick of Honduras—I do not know whether it is the same as that which is found in other parts of the West Indies—possesses other virtues besides that of beautifying the teeth,—it is a very powerful fermentative. It has a bitter flavour, but not more so than the hop, and it is considered to be a very good tonic. Who has not heard of Betsy Austin? she who was erst of Barbadoes—that is, coast—the natives of which brag that they are "neither crabs nor creoles, but true Barbadions born." She has been celebrated in prose and in verse, in fiction, and in authentic history quite as fabulous. But no poet has ever sung Betsy Potts. If England had her Robin Hood, Scotland had her own Rob Roy; if Barbadoes could boast of Betsy Austin, Belize can boast of Betsy Potts. What pert middy, what captain bold, what greasy, unkempt skipper, has not been indebted to Betsy Potts. From champagne and hock, to British gin and bitter beer, from paté de fois gras, and potage à la Jullien, to salt beef and pickled herrings, she could supply them. But she has not been appreciated as she deserved.

> "A primrose by the river's brim,
> A *yellow* primrose was to him,
> And it was nothing more."

Well—this same Miss Elizabeth Potts makes excellent ginger beer, and the only fermenting power which she uses is an infusion of the chew stick. About two feet of it is sufficient to ferment nine dozen bottles of ginger beer. Now, I am strongly of opinion that the chew stick would be a very good substitute for yeast, and in many respects would be far superior to it. It will keep for a great length of time; it is easily portable, and it would not be liable to deterioration in any climate. An experiment, I think, would be desirable. I have sent some chew stick, in order that it may be tried, if you think proper.

The wild cotton tree of this country grows to an immense size. The trunk of that tree is sometimes 20 feet in diameter. It is proportionately high, and the branches are far-spreading. It bears a light grey-coloured cotton, which is enclosed in a green pod, from four to six inches in length. This cotton is extremely soft and silky, but the staple is short. When the cotton is mature the pods burst, and their contents are blown by the wind in every direction. The ground in the neighbourhood of a cotton tree has sometimes the appearance of being covered with snow. Perhaps this cotton might be turned to some useful purpose. I have sent you two pods, in order that they may be examined by those who understand the various uses to which cotton may be applied.

There is a singular tree which grows very plentifully in Honduras, called by the Creoles the bobwood. The roots of this tree, which run along the surface of the ground for a considerable distance, are very light and spongy. The negroes, who are up the different rivers, make corks of them, and also use them for sharpening their razors. I have thought it right to send you a sample of this wood, in order that its applicability to any good purpose may be ascertained.

In one of the admirable letters of the *Times'* Special Correspondent in the Crimea, there is a statement that the shoes which were furnished to our troops were not only very uneasy to the foot, but were also very unserviceable, and that the soles, adhering to the mud, very unceremoniously parted company with the upper-leathers. It has struck me that a much better garment for the foot, in such a country as the Crimea is described to be, than the

ordinary shoe, with its thick, clumsy sole, and stiff unpliable upper-leather, would be the moccassin. The moccassin is worn by all the mahogany cutters, and it has this advantage over the common shoe —it is exceedingly soft and easy to the foot, and it is not liable to be pulled off by the adhesiveness of the soil—and the mud of the Crimea cannot be more adhesive than the clay in the mahogany works of Honduras.

The moccassin is made of undressed deer's skin, and it comes a little above the ancle when it is tied. It is not impervious to the wet, very much to the contrary, but it cleaves to the foot with a tenacity which no clay in the world could overcome. The North American Indian will go on a trail for 50 or 100 miles with a pair of moccassins on, without being in the slightest degree foot-sore. In order to clean it, no blacking is necessary; it is simply washed and hung on the hedge to dry. It might be pipe-clayed. And it might easily be made waterproof by smearing it with a solution of India rubber in spirits of turpentine. To soldiers on a march, with woollen socks on their feet, moccassins would be an inestimable treasure. I have sent you two pairs of these pedal habiliments, in order that you may have an opportunity of forming an opinion respecting them.

I have, &c.
R. TEMPLE.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette August 3rd*, 1855.]

Dated 22nd June, 1855.

1433. S. E. G. Simon, Paris—New material for paper.

Dated 28th June, 1855.

1474. Captain C. J. Symons, B.A, Hereford—Steam engines.

Dated 3rd July, 1855.

1498. W. Hammant, 1, Standfield-street, Stepney—Condensing smoke.

Dated 9th July, 1855.

1534. H. Crossley, Grove, Camberwell—Projectiles.

Dated 10th July, 1855.

1540. E. Kopp, Accrington—Mordants.

Dated 12th July, 1855.

1557. B. Greening, Manchester—Washing and mangling machinery.
1559. J. Bethell, 8, Parliament-street, Preserving provisions.
1561. E. D. Chattaway, Edinburgh—Railway buffing and coupling apparatus.
1563. E. Simons, Birmingham—Condensing smoke of, and increasing illumination from, gas flames.
1564. J. H. Weston, Cross-street, Newington Butts, and J. E. Lewis, Nicholas-street, New North road—Moderator lamps.
1565. R. D. Obissier, Bordeaux—Motive power.

Dated 13th July, 1855.

1569. J. Higgin, Manchester—Clearing and brightening dyed and printed fabrics.
1571. G. T. Bousfield, Sussex-place, Brixton—Boots and shoes. (A communication.)
1573. R. Hornsby, Grantham—Thrashing machines.
1575. M. Lawton and T. Schofield, Micklehurst—Spinning machinery.
1577. R. Yeates, Trafalgar place-west, Hackney-road—Lock and lever knives.
1579. R. Burns, Liverpool—Teethed gear.
1581. P. J. A. Gaudin, Skinner-street, Snow-hill—Baths for photographic purposes.
1583. L. C. J. Poliesse, jun., and C. A. J. Lengelée, Ham, France—Encaustic matters.

Dated 14th July, 1855.

1584. J. J. Derricij, Paris—Lozenges, wafers, pastiles, &c.
1585. F. Hamilton, Bolton-le-Moors—Carding engines.
1586. T. Sadleir, Mulla, Tullamore—Heating liquids.
1587. F. Burke, Montserrat, West Indies—Preparing fibres of plantain, banana, aloe, &c.
1588. E. S. Atkinson, Knottingley—Condensing muriatic acid gas arising in the manufacture of sulphate of soda.
1589. J. F. Kealey, Oxford-street—Pulping vegetable substances.

Dated 16th July, 1855.

1590. W. H. Tayler, 19, South-row, St. Pancras—Screw cap and fittings. (A communication.)
1591. A. Reggazzoli, Milan—Impelling railway carriages up ascents. (A communication.)
1592. L. Gavioli, Modena—Musical instrument, called clavi-accord.
1693. J. B. Pascal, Lyons—Motive power.
1594. J. H. Tuck, Pall Mall—Blowing apparatus. (A communication.)
1595. J. Newman, Birmingham, and W. Whittle, Smethwick—Axles.
1596. W. E. Newton, 66, Chancery-lane—Vices. (A communication.)
1597. W. E. Newton, 66, Chancery-lane—Mechanism for operating shuttles of looms. (A communication.)

Dated 17th July, 1855.

1598. P. Laroche, Saventhem, Belgium—Rotary steam engine.
1601. S. Salaville, Paris—Airing and preserving grain, seed, apples, &c.
1602. W. Jenner, Southwark—Beverage.
1603. H. S. Boase, Claverhouse, Dundee—Drying organic substances.
1604. A. Burdess, Rugby—Oil feeders.
1905. E. Scragg, Buglawton, Congleton—Steam engines.
1606. H. Huthnance, Stratford—Combustion of coals.
1607. E. Barry, Soho-square—Musical instruments played with a key-board, similar to that of a piano.

Dated 18th July, 1855.

1610. F. Hoyos, Paris—Roasting spits.
1611. T. Almgill, Busby, near Glasgow—Printing on calico, &c.
1612. J. Reilly, Dublin—Iron hoops for casks.
1613. C. Toye, 42, Gloucester street, Queen-square—Looms.
1614. W. Smith, Aston, Birmingham—Steel wire.
1615. T. Trapp, Mile-end—Connecting and disconnecting shafts. (A communication.)
1616. J. Ellis, Heckmondwicke—Ammonia, charcoal, animal and vegetable naphtha.
1617. J. Pollard, Bexley-heath—Gas.
1618. W. Ball, Ilkeston, and J. Wilkins, Nottingham—Warp fabrics.
1619. J. King and J. Holdsworth, Rochdale—Woven cotton fabrics.
1620. A. E. L. Bellford, 32, Essex-street, Strand—Condensing vapours or smoke. (A communication.)
1621. A. E. L. Bellford, 32, Essex-street, Strand—Induction and eduction valves of steam engines. (A communication.)
1622. V. Scully and B. J. Heywood, Dublin—Cocks and taps.
1623. V. Scully and B. J. Heywood, Dublin—Locks, latches, and keys.

Dated 19th July, 1855.

1624. R. Martin, Reading, and J. C. Martin, ?, Pullen's-row, Islington—Obtaining pulp from wood.
1625. J. P. Clarke, Leicester—Metallic reels.
1926. S. B. Wright, Parkfield stone, and H. T. Green, Moreton, both in Staffordshire—Bricks and tiles.
1627. J. G. Laurie, Glasgow—Steam engines.
1628. P. Bertinetti, Paris—Projectile.
1629. D. and T. R. H. Fisken, Stockton-on-Tees—Tillage of land by machinery.
1630. E. A. Ferryman, Wadenhoe, near Oundle—Churn.
1631. J. Thompson and J. Mills, Manchester—Power looms.
1632. J. H. Woolbert, Brussels—Madder and application. (Partly a communication.)
1633. J. H. Johnson, 47, Lincoln's-inn-fields—Transmitting motive power, principally to horse mills. (A communication.)
1634. J. H. Johnson, 47, Lincoln's-inn-fields—Railway breaks. (A communication.)
1635. J. H. Johnson, 47, Lincoln's-inn-fields—Reeds for weaving. (A communication.)
1636. T. Broadbent, jun., Crawford-street—Filtering liquids.
1637. M. F. Isoard, Paris—Generating steam.

Dated 20th July, 1855.

1640. H. D. P. Cunningham, Gosport—Reefing sails.
1642. J. H. Johnson, 47, Lincoln's-inn-fields—Motive power. (A communication.)
1644. G. Conner, Liverpool—Brushes.
1646. C. Deschamps and C. Vilcoq, Paris—Free diving boats.

Dated 21st July, 1855.

1652. R. M'Laren and S. W. Pugh, Peckham—Artificial fuel and fire lighters.
1654. C. Goodyear, 25, Avenue-road, St. John's-wood—Printing surfaces. (Partly a communication.)
1656. A. Dugdale, Paris—Locomotive engines.
1660. W. E. Kenworthy and H. Greenwood, Leeds—Screw propellers.

Dated 23rd July, 1855.

1662. H. W. Ripley, Bradford—Finishing woven fabrics. (Partly a communication.)
1664. C. Goodyear, 25, Avenue-road, St. John's-wood—Moulded articles of compounds of india rubber. (A communication.)
1666. C. Goodyear, 25, Avenue-road, St. John's-wood—Combs.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
3741	August 4.	New Soap Cutting Machine	Isaac Shaw	102, North-lane, Brighton.
3742	August 8.	The Improved Mule Portmanteau	Geo. Robert and John Bengough	4, Tichborne-street, Piccadilly.